I. C. 6851 SEPTEMBER 1935

DEPARTMENT OF THE INTERIOR

UNITED STATES BUREAU OF MINES
JOHN W. FINCH, DIRECTOR

INFORMATION CIRCULAR

MINING METHODS AND COSTS AT THE EUREKA STANDARD MINE

RECEIVED
2017

BY

E. D. GARDNER

OHIO STATE
UNIVERSITY

AFTER THIS REPORT HAS SERVED YOUR PURPOSE AND IF YOU HAVE NO FURTHER NEED FOR IT, PLEASE RETURN IT TO THE BUREAU OF MINES, USING THE OFFICIAL MAILING LABEL ON THE INSIDE OF THE BACK COVER.

Generated on 2024-09-18 02:00 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

Digitized by Google

Original from
THE OHIO STATE UNIVERSITY

I.C. 6851
September 1935

INFORMATION CIRCULAR

DEPARTMENT OF THE INTERIOR - BUREAU OF MINES

MINING METHODS AND COSTS AT THE EUREKA STANDARD MINE[1]

By E. D. Gardner[2]

INTRODUCTION

The mine of the Eureka Standard Consolidated Mining Co. is at Dividend, Utah, in the Tintic mining district. It is operated under the same management and controlled by the Tintic Standard Mining Co.; the two properties adjoin each other.

The Eureka Standard is worked through a vertical shaft; the ore is mined by a stringer-set-and-fill method. One hundred and thirty men were employed in April 1933. The normal daily tonnage is 100 tons; the ore is shipped to the smelter at Garfield, Utah.

ACKNOWLEDGMENTS

James W. Wade, general manager, and the staff of the Eureka Standard Consolidated Mining Co. supplied the information from which this paper was written.

GEOLOGY

The main ore bodies in the Tintic district occur in limestone. The ore at the Eureka Standard, however, is in quartzite, which before development of the mine was not considered ore-bearing. The quartzite is overlain with shale and is lower geologically than the limestone in the district. The vein is a fault fissure in the quartzite near the contact with the shale.

In places faulting action has dropped the shale to form the hanging wall of the vein, which requires immediate support; moreover, the nearness of the shale elsewhere over the orebodies makes the hanging wall heavy.

---

1 The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U.S. Bureau of Mines Information Circular 6851."

2 Supervising engineer, U.S. Bureau of Mines Southwest Experiment Station, Tucson, Ariz.

725553

Generated on 2024-09-18 01:52 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

The vein dips from 45° to 60°; the average dip is 55°. The average thickness of the ore in the main vein is 5 feet; the ore feathers out at the edges of the shoots.

The vein matter is fractured quartzite. The principal gold-bearing minerals are tetrahedrite and enargite associated with bornite and pyrite. Argentite occurs in the high-grade streaks; hessite and calaverite are found occasionally. Galena is a minor accessory mineral in parts of the mine.

The permanent water level in the mine is 1,314 feet below the collar of the shaft; this horizon corresponds roughly with the level of Utah Lake 10 miles distant. The temperature of the mine water ranges from 80° to 125° F.

The method of sampling and estimating ore tonnages is the same as that at the Tintic Standard mine.[3]

HISTORY

After a study of the geology of the surface and of the formation as disclosed in a crosscut from the Tintic Standard mine a shaft was begun in 1924. Ore was struck in June 1928 and the 1,100 level. Production was started on a 50-ton-per-day basis and later brought up to 3,000 per month. The first ore mined was hoisted in the Tintic Standard shaft. The production of ore and metals to the end of 1932 is shown in table 1.

In 1929 the shaft was extended to the 1,300 level and a crosscut run to the vein. By March 1, 1930 a new hoist, steel headframe, compressor, changehouse, ore bin, conveying equipment, and railroad spur were completed. All of the development work done and equipment purchased after shipments began was paid from the company's earnings.

In 1930 the gross proceeds from all metals were $793,412; after smelting and freight charges of $201,987 were paid, the net smelter returns amounted to $591,425. After $296,072 was deducted for miscellaneous expenses, including $12,612 for taxes, the net profit carried to surplus account was $297,091. The initial dividend of $44,987.70 was paid in September 1930; the second of the same amount was paid in December. The mine ranked second as a producer of gold and eleventh as a producer of silver in Utah in 1930. In 1931 it ranked fifth as a producer of silver.

In 1931 gross proceeds of all metals were $1,186,516; after freight and smelting charges of $260,902 were deducted, net smelter returns were $925,614. The total income was $929,775. After expenses of $453,373, including depreciation and taxes were paid, a net profit of $476,402 was carried to surplus account. Dividends of $179,951 were paid in 1931.

---

3 Wade, James W., Mining Methods and Costs at Tintic Standard mine, Tintic District, Utah: Inf. Circ. 6360, Bureau of Mines, October 1930, 21 pp.

Generated on 2024-09-18 01:57 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

TABLE 1. - Production at Eureka Standard mine

Year	Production				
	Tons	Gold, ounces	Silver, ounces	Copper, pounds	Lead, pounds
1928 ..	4,296	3,284.75	45,440	13,789	49,931
1929 ..	18,363	14,755.42	193,098	68,360	191,981
1930 ..	28,459	30,540.37	295,169	208,737	567,950
1931 ..	36,622	48,206.57	452,251	293,969	886,337
1932 ..	36,294.38	39,274	337,251	345,083	842,189

In 1932 the ore had a gross sale value of $950,570, and after all charges were deducted the net profit for the year was $232,703. During the year the property was the fifth largest lode gold mine in the United States.

SURFACE EQUIPMENT

The equipment at the surface was used principally in connection with hoisting and air compression.

Drill steel was sharpened and minor repairs of equipment were made in a blacksmith shop near the shaft. All major repairs were made and electrical and machine work performed in the Tintic Standard shops.

In May 1933 the equipment consisted of an 85-foot steel headframe, a double-drum hoist with $3\frac{1}{2}$- by $4\frac{1}{2}$-foot drums and run by a 200-hp. induction motor; an air compressor with a capacity of 2,690 cubic feet of free air per minute under 100 pounds pressure per square inch; a transformer, switchboards, and other electrical equipment in connection with hoisting and air compression; a 34-inch belt conveyor 75 feet long with an apron feeder; a 150-ton steel ore bin; a drill sharpener and oil heating furnaces; and a two-man blacksmith shop.

No living quarters or general offices were maintained at the mine. The workmen and the supervisory force were carried to and from Dividend, 1 1/2 miles distant, in busses or rode to work in private cars. The buildings at the mine consisted of a steel and corrugated-iron structure 25 by 63 feet over the hoist and compressor, a 30- by 50- foot changehouse, a 20- by 30-foot blacksmith shop, a 12- by 20-foot mine office and storeroom, and a two-room foreman's cottage.

The following table shows the expense of equipping the mine, both above and below ground, up to December 31, 1932.

Generated on 2024-09-18 02:00 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

Assets as of December 31, 1932

Buildings and headframe	$67,300.03
Machinery	61,107.00
Electrical equipment	39,792.98
Other equipment	123,717.18
Water system	7,482.04
Furnishing and fixtures	109.00
Total	299,508.23

METHODS OF DEVELOPMENT

The mine is developed and worked through a five-compartment shaft 1,424 feet deep. Levels are run at 800, 900, 1,000, 1,100, and 1,300 feet from the surface. In addition, two sublevels have been driven below the 1,300-foot drift; the first is 500 feet long from a 50-foot winze and the second 400 feet long at the 1,400 level. Disregarding sublevels between the upper levels, 6,600 feet of drifting has been done on the vein.

The mine is connected with the Tintic Standard on the 800 level and to the Iron King No. 2 shaft on the 1,300 level.

The vein is prospected and the ore developed by raises at 100-foot intervals. If justified by geological evidence or needed for mining purposes, other raises are run midway between the first series.

The vein is prospected further by driving sublevels at strategic points between the main levels ahead of stoping. Prospecting crosscuts are run into the hanging wall at geologically favorable places and where needed for waste filling.

Shaft

The shaft is 5 feet 11 1/2 inches by 22 feet outside of the 8- by 8-inch timbers; it is divided into two 4-foot 1-inch by 4-foot 8-inch hoisting compartments, one 8-foot 4-inch by 4-foot 8-inch ventilation and pump compartment, and a 2-foot 6-inch by 4-foot 8-inch ladder and cableway.

Drifts and Crosscuts

The main haulageways are 6 by 9 feet in section; drifts on the vein are run 5 by 7 feet in size. Drift rounds in the smaller headings consist of 11 to 13 holes about 4 feet deep. An average round consists of 3 downward toe-cut holes, 2 relievers, 3 back holes, and 3 lifters. Development rounds are blasted with 40-percent-strength gelatin dynamite. A cycle is made in a drift face each shift; the broken rock from the previous round is loaded out while the round is being drilled. The round is blasted at the end of the shift.

Generated on 2024-09-18 01:53 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

A mechanical loader is used in the 6- by 9-foot headings. A round consisting of seventeen 0.9-ton cars is loaded out in 3 hours; one man operates the machine and another trams the cars in and out. Where a plentiful supply of broken rock exists and the loader can be kept steadily supplied with cars 27 tons can be loaded in 1 hour.

One and one quarter inch round steel is used with drifters; 1-inch quarter octagon in stopers, and 7/8-inch hexagon in jackhammers. A driller uses one or more 3-piece sets of steel in drifts and raises and one or more sets in stopes.

Raises

Raises are 12 feet by the width of the vein in section. Raise rounds consist of 8 to 16 holes; the average distance broken per round is a little less than 3 feet.

STOPING

As stated before, the ore is developed by drifts about 120 feet apart vertically and raises from the drifts on 50-or 100-foot centers. Preparatory to mining, the prospect raises are widened to three sets; they are then used for ore chutes and manways and for bringing waste filling into stopes. Stopes between the 1,300 and 1,100 levels when completed are 27 floors high; sublevels from raises are run at various intervals for bringing in waste filling and for access to the stopes.

A cross-section of a typical Eureka Standard stope is shown in figure 1. The drift is timbered with stringer sets 6 feet center to center. The caps or stringers are of 8- by 8-inch timber about 10 feet long. The ends of the caps are blocked against the solid. The posts are of 10-inch round timber and are 8 feet long; they rest on 8- by 8-inch sills blocked into place. Split round poles are used for collar bracing. Scabbing nailed on the caps and sills prevents lateral movement.

After the drift timbering is in, stoping begins. The first rounds are drilled from small stagings set up in the drift. Hand-rotated stopers are used. The first ore is broken on lagging platforms and shoveled into cars. As the stope rises ore chutes are installed, and the ore is drawn directly into cars.

As stoping operations continue, timbering is put in place as shown in the section. The sets are 6 feet center to center both horizontally and vertically. Posts are placed directly over one another if possible, or they are placed directly over a block on the footwall, thus carrying the weight vertically downward. For loose or heavy ground small stulls or back lagging can be utilized as illustrated.

After a section is mined up to the next level or sublevel, preparations are made for filling the stope. If the face on either side of the section indicates continuation of the ore, it is laced off with vertical lagging 6 feet long. However, it is rarely necessary to fill before the ore is completely

Generated on 2024-09-18 01:53 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

mined out. The caps on the sill floor are then relieved of their scabs, and the posts are chopped out if necessary. Two 10 by 10 squeeze blocks are then placed over the sill floor posts as illustrated, then a 10 by 10 is placed on these blocks and wedged tight with blocks and wedges. Round poles are then placed longitudinally over the 10 by 10 caps. The number of round poles varies with the width of the fissure, the number usually running about three to a horizontal distance of 6 to 7 feet. The round poles are covered with a layer of new lagging and a layer of used lagging on which is placed cribbing made of old pieces of timber. The cribbing is intended to take the shock of falling rock when the stope is first being filled. Filling for the stope is obtained from waste drifts run for that purpose or from exploration drifts at geologically favorable places. Waste occuring in the ore is sorted out and placed in the gob.

All timber is left in place during the filling operations; the only timber saved is the flooring (lagging used between stringers for a working floor).

From 6 to 8 places are worked at the same time, although 15 to 20 places usually are opened up ready for working. A stope crew consists of a drill runner and a shoveler. Usually only one section in a stope is worked at one time. The drill runner and shoveler do their own timbering as a rule. Timber crews consisting of a timberman and a helper work on special jobs, such as building chutes, repairing broken timbers, or timbering exceptionally heavy stopes.

Stoping and raising are done with hand-rotated wet stopers; 10 of these machines are in daily use. Six jackhammers are used for block holing in stopes and for other miscellaneous work in the mine.

A stope round consists of 6 or 7 holes each loaded with 1 or 2 cartridges of 25-percent strength gelatin dynamite. A mine rule limits the charge to two sticks per hole. An average of 15 cars or 13 1/2 tons is broken per round. A ton of ore occupies 12 cubic feet in the solid and 20 cubic feet when broken.

HOISTING

The ore and waste are hoisted in 40-cubic-foot self-dumping skips; men and material are handled on cages. Hoisting may be done in 2 skips running in balance or in 1 skip running in balance with a cage. Cages are used in both hoisting compartments for lowering and hoisting the shift. Skips or cages when not in use are set on trucks 10 feet long standing on tracks at the collar of the shaft. To change from a skip to a cage an empty truck is run over the compartment on a sectional track and the skip is lowered and detached from the hoisting cable. The cage on the truck is then pushed into place and attached to the cable. A transfer is made in 10 minutes.

The skips are dumped in 1 of 2 hoppers; waste is run to a dump. The ore is transferred by the belt conveyor to the ore bins where it is loaded into 70-ton cars for shipment to the smelter. When nothing interferes with the work, 12 skips can be hoisted per hour.

Generated on 2024-09-18 01:54 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

Waste is hoisted in cars for filling; 100 cars can be handled in 8 hours from the 1,300 to 1,100 levels. The cages are single-decked and hold 1 car each.

Long timbers and other heavy material are raised for loading on the cage by means of a scraper hoist set near the collar of the shaft. The sheave is attached above the shaft compartment to the first steel member of the headframe. The bonnet of the cage is raised and the material lowered into place.

The hoist that was used in sinking the shaft is used for running a "chippy" cage in the pump compartment; this cage is employed by men working in the shaft.

Two men, a cage rider and a station tender, load skips and handle waste cars and supplies on the cages. Two top carmen on day and one on night shift handle waste and do other work at the surface in connection with hoisting.

UNDERGROUND HAULAGE

A storage-battery locomotive is used for tramming underground on the main levels. It is transferred from level to level on the cage and brought to the surface for changing batteries. One battery is used on day shift and one on night shift. Two batteries have been in use for 3 years and have required no repairs. The locomotive can pull fourteen 0.9-ton cars; an average train is 10 to 12 cars. Ore is moved to the station by hand on sublevels.

Track gage is 18 inches; most of the track consists of 12-pound rails set on steel ties on 4- to 5-foot centers.

Eighteen-cubic-foot end-dump cars are used. A turntable under the body permits the cars to be discharged at the end or either side. The ore is dumped at the stations on grizzlies with 8-inch spaces between the bars. A relatively small amount of material must be broken by hammers to pass through the grizzlies.

Ore chutes are built between sets. The bottom consists of three 12-inch planks. The chute opening is 2 feet 4 inches wide. Board gates are used.

The haulage crew consists of a motorman and a helper. In addition to pulling the ore trains to the shaft, this crew hauls waste to the shaft on the 1,300-foot level and pulls it to the waste raises on the 1,100 level. Two men tram and dump waste cars.

PUMPING

Practically all the water comes from the sublevels below the 1,300. The water is raised through 6-inch pipe to the 1,300 level and thence runs by gravity through a 14-inch-diameter 10-gage pipe to the 1,300 station sump which has a capacity of 17,600 gallons.

Generated on 2024-09-18 01:56 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

From the 1,300 level the water is raised directly to the surface by a 1,000-gallon-per-minute pump and by two 600-gallon-per-minute pumps in series. One of the 600-gallon pumps is on the 1,300 and the other on the 800 level. Two lines of 6-inch and one line of 12-inch pipe are used in the shaft.

The pumping equipment is as follows:

3 no. 3 R. V. Cameron pumps with a capacity of 400 gallons per minute each, under a 110-foot head and run by 15-hp., 65-volt motors; in sublevel.

3 no. 4 R. V. Cameron pumps with a capacity of 800 gallons per minute each, under a head of 100 feet, and run by 25-hp., 110-volt motors; in sublevel.

2 no. 5 H. M. T. Cameron station pumps on 1,300 level discharging at surface, with a capacity of 1,000 gallons per minute, run by 500-hp., 2,300-volt motors.

2 no. 4 H. S. T. Cameron station pumps on 1,300 level discharging on 800 level, with a capacity of 600 gallons per minute, run by 200-hp., 2,300-volt motors.

2 no. 4 H. S. T. Cameron station pumps on the 800 level discharging at surface, with a capacity of 600 gallons per minute, run by 200-hp., 2,300-volt motors.

The 600-gallon pumps run an average of 13 hours during each 24 hours and the 1,000-gallon pumps 9 hours.

Pumping costs in January and February 1933 are shown in the following table.

Month	Power	Labor	Repairs	Total
January.....	$1,388.86	$487.08	$97.70	$1,983.66
February.....	1,631.28	405.50	50.58	2,093.36

VENTILATION

The Iron King No. 2 shaft is used as an up-cast and the main shaft as a down-cast airway. The mine is ventilated by means of a no. 12 Plexiform fan run by a 100-hp. motor on the 1,450 level of the up-cast shaft. This fan has a capacity of 76,000 cubic feet per minute at 3 1/2 inches water gage. A 6-foot Aerovane booster fan run by a 60-hp. motor is used underground to assist the surface fan. The booster has a capacity of 40,000 cubic feet at 3.2 inches pressure.

Stopes and dead-end drifts are ventilated by 22 no. 2 1/2 size blowers, mostly of the Vano and Ventair types. Six are air-driven and the others

Generated on 2024-09-18 01:54 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

electric. Sixteen- and eighteen-inch pipe is used in the main splits with 10-inch branches into stopes or dead-end drifts.

To keep the mine air from being humidified the water is conveyed from the pumps at the winzes to the main sump at the shaft through pipes instead of in ditches or flumes. The temperature of this water is over 100° F.

POWDER MAGAZINE

The main powder magazine holds two railroad carloads of explosive. It consists of a drift run in the mountain on the other side of a ridge and 2,000 feet from the shaft. A bulletproof door is used.

To discourage trucking explosives on the highways, the manufacturer quotes the same price f.o.b. cars at Dividend as at the plant in the Salt Lake Valley.

FIRE PROTECTION

All inflammable trash is promptly removed from the mine. Periodical inspection is made of all electrical wiring and installations underground.

A small guniting machine mounted on a mine truck is used for sealing ventilation doors and for fireproofing timber underground.

SHARPENING STEEL

The steel is sharpened near the shaft. Oil furnaces are used for heating. An average of 1,000 gallons of fuel oil at 6 cents per gallon is used monthly in the furnace. An average of 200 pieces of steel is sharpened daily. Drill steel is sharpened as an accommodation to a nearby small operator at 25 cents per bit. Only a few pieces are handled at a time.

A blacksmith and helper make miscellaneous repairs at the mine; 600 pounds of coal and 600 pounds of coke are used in the blacksmith shop monthly. Drill repairs and all heavy work are done for the company at the Tintic Standard shops.

SURFACE TRUCKING

A 1 1/2- and a 3-ton truck are used in hauling supplies to the mine; a 1 1/2-ton truck is used at the mine.

The freight rate on supplies on the regular truck line from Salt Lake City was 42 to 68 cents per 100 pounds.

LABOR

In April 1933 no bonus or contract systems were in use.

Generated on 2024-09-18 01:56 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

An average of 130 men was on the pay roll; of these 115 worked underground. The force actually employed in stopes on ore consisted of 11 machine miners, 11 shovelers, 6 timbermen, and 6 timbermen helpers. In addition two timber crews were employed on special repair work about the mine.

The wage scale established on March 20, 1932 and in force May 1, 1933 was as follows:

Underground

Shift bosses	$5.00	Motormen	$3.50
Shaftmen, repairs	4.25	Pipe and track men	3.50
Shaftmen helpers, repairs	4.00	Pipe- and track-men helpers	3.25
Shaftmen, sinking	4.25	Pumpmen	3.50
Shaftmen, sinking in water	4.50	Topmen, lead	3.50
Miners	3.50	Topmen	3.00
Muckers	3.00	Cagers	3.50
Timbermen	3.50	Cagers helpers	3.25
Timbermen helpers	3.25	Ventilation men	3.50
Trammers	3.00	Ventilation-men helpers	3.25

Mechanical Department

Hoisting engineer	$4.25	Machinist	$4.00
Hoisting engineer (donkey underground)	3.50	Welder	4.00
Compressormen	3.25	Tool sharpeners	4.00
Blacksmith	4.25 - 4.00	Drill-machine repairmen	4.25
Blacksmith helpers	2.75	Pipe fitter	3.25

Electrical Department

Electrician	$4.25	Electrician helper	$3.75

Truck Department

Mechanic	$4.75	Truck-driver helpers	$2.75
Truck driver	3.25		

Carpenter Shop and General Surface

Carpenters	$4.25	Timber-framer helpers	$2.75
Carpenter helpers	3.00	Laborers	2.75
Brick mason	3.75	Watchman	3.25
Teamster	3.50 - 3.25	Powderman	3.25
Timber framer	3.00		

Assay Office

Assistant assayer	$3.50	Assay helpers	$2.75
Assay helpers	3.00	Sample buckers	2.75

Generated on 2024-09-18 01:53 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

Two increases in pay were granted in September 1933, and the force was put on a 5-day week. Miners received $4.75 and muckers $4.25 after these increases; other classifications were increased accordingly.

Prior to this change the mines in the district were operated 7 days per week. The length of a shift is 8 hours.

SMELTING

The ore is desired by the Garfield smelter for its silica content in smelting copper concentrates. The gangue is principally quartzite.

The distance to the smelter is 120 miles. The freight rate is as follows:

Value of ore, dollars	Freight per ton
Up to 6	$0.75
6 to 8	.90
8 to 10	1.00
10 to 15	1.10
15 to 20	1.25

Above $20 the freight rate increases $0.25 per ton for each $10 increase in value of the ore.

The base smelting rate is $3 per ton. Where the gross value of the ore is over $10 per ton, the sampling rate is $0.35; under $10 the rate is $0.50 per ton.

The smelting contract provided for the payment of the metals according to the following schedule:

Metal	Proportion on which payment was made, percent	Price paid
Gold	100	$20 per ounce
Silver	95	New York quotation
Lead	50	market, minus $0.0352 per pound
Copper	70	market, minus $0.0202 per pound

The copper content of ore is about 1 percent.

The free market for gold has been established since the smelter contract was made. The smelter continues to pay for the gold in the ore on receipt at $20 per ounce as received. The difference between $20.67 and the price received by the smelting company, minus a percentage for smelter losses, minus 1 1/2 percent handling charges, is paid to the mining company as of the date of sale of the gold.

Generated on 2024-09-18 01:55 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

COSTS

Table 2 gives a summary of mining costs in February 1933, not including administration or taxes. Comparative costs in January and February 1933 of labor, material, and power are contained in table 3 and segregated labor costs in table 4. Table 5 shows the labor and explosive cost for different kinds of development work in 1932. The total cost of sinking the shaft and running the 1,100 and 1,300 levels to the end of 1932, as calculated for the purpose of capitalizing the development work, is shown in table 6. Table 7 gives the total cost of development as capitalized and table 8 the fixed assets as of September 30, 1931.

TABLE 2. - Costs per ton of ore hoisted, February 1933[1/]
(3,737.0 tons)

	Labor	Explosives	Timber	Power	Supplies	Total
Development	2/ $0.96	(3/)	.....	.....	.....	$0.96
Stoping	2/ 1.52	(3/)	4/ $0.51	.....	5/ $0.62	2.65
Hoisting	.16	0	0	$0.33	.....	.49
Tramming	.17	0	0	.....	.....	.17
Air compression	.05	0	0	.31	.....	.36
Pumping	.11	0	0	.43	.....	6/ .54
Maintenance and filling	.22	0	.....	.....	.....	.22
General and surface	1.55	.....	.....	7/ .46	.....	2.01
Total	8/ 4.39	$0.35	0.51	1.53	0.62	7.40

1 - Does not include administration or taxes.
2 - Includes explosives.
3 - Explosive for development and stoping, $0.35 per ton of ore
4 - Includes timber used in development.
5 - All departments of the mine.
6 - Does not include new pipe line on 1,300-foot level; cost $477.00.
7 - Principally ventilation.
8 - $0.35 per ton for explosives subtracted.

TABLE 3. - Costs per ton of ore hoisted, January and February 1933[1/]

Month	Dry tons	Labor	Material	Power	Total
January	3,886.9	$4.798	$1.777	$1.339	$7.914
February	3,737.0	4.391	1.484	1.534	7.409

1 - Does not include administration or taxes.

NOTE: Power and supplies prices: Power, average, 1 cent per kw.-hr.; explosives (40 percent gelatin dynamite) $12.50 per 100 pounds; timber, sawn, $28 to $30 per 1,000 feet, and round, average 8-inch diameter, 11 cents per linear foot.

Generated on 2024-09-18 01:56 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

Generated on 2024-09-18 01:54 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google

TABLE 4. - Segregated labor costs, January and February 1933

Month	Miners	Timbermen	Muckers	General direct labor	Indirect labor	1/ Shops	Total	Costs per ton
January....	$2,086.04	$2,251.95	$2,471.67	$2,290.00	$5,110.62	$3,482.66	$17,692.94	$4.55
February...	2,301.41	2,045.02	2,584.56	1,851.00	4,178.29	3,447.17	16,407.95	4.39

1 - Work done for Eureka Standard by Tintic Standard; shop work, assaying, etc.

TABLE 5. - Development costs, 1932; labor and explosives only

	Direct labor1/	Explosive	Total	Footage	Cost per foot
Drifts and crosscuts..	$10,801.13	$3,749.81	$14,550.94	2,301	$6.323
Drifts from winze.....	10,971.55	1,705.19	12,676.74	624	20.315
Raises.....	4,947.44	834.85	5,782.29	441	13.111
Main winze.....	8,533.62	393.33	8,926.95	184	48.516
Other winzes.....	1,399.13	150.63	1,549.76	84	18.449
Total.....	36,652.87	6,833.81	43,486.68	3,634	11.969

1 - Includes cost of placing timber where needed in development work.

Digitized by Google
Original from THE OHIO STATE UNIVERSITY

TABLE 6. - Cost of development work 1924-31, inclusive; 1,100 and 1,300 levels and shaft

Item	1,100 level	1,300 level	Shaft
Total footage	2,643.5	4,281.0	1,424.2
Direct expenses:			
Labor	$19,035.62	$32,329.28	$89,209.85
Material (mostly explosives)	4,752.62	8,711.22	46,873.26
Total	23,788.24	41,040.50	136,081.11
Cost per foot	9.00	9.59	95.56
Indirect expenses:			
Labor	14,819.82	23,299.29	23,544.84
Material	7,431.18	13,875.64	8,985.10
Power	4,044.82	11,668.56	9,236.10
General	3,599.44	10,193.20	7,565.71
Total	29,895.26	59,036.69	49,331.75
Cost per foot	11.31	13.78	34.64
Grand total	53,683.50	100,077.19	185,412.86
Total per foot	20.31	23.37	130.20

TABLE 7. - Total development, capitalized

Expended 1917 to end of 1927	$290,236.48
Upper levels, 1928 to September 30, 1931 (includes 722 feet of drifting and 89 feet of raises)	23,086.93
Iron King drift, 1,700 feet in length	26,280.58
Other development	57,100.06
Total development capitalized	396,704.05

TABLE 8. - Fixed assets, September 30, 1931

Development	$317,187.57
Mining property	197,043.45
Patents, lands, etc	3,875.56
Plants, equipment, and buildings (net)	176,244.82
Total fixed assets	694,315.40

Generated on 2024-09-18 02:00 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from THE OHIO STATE UNIVERSITY

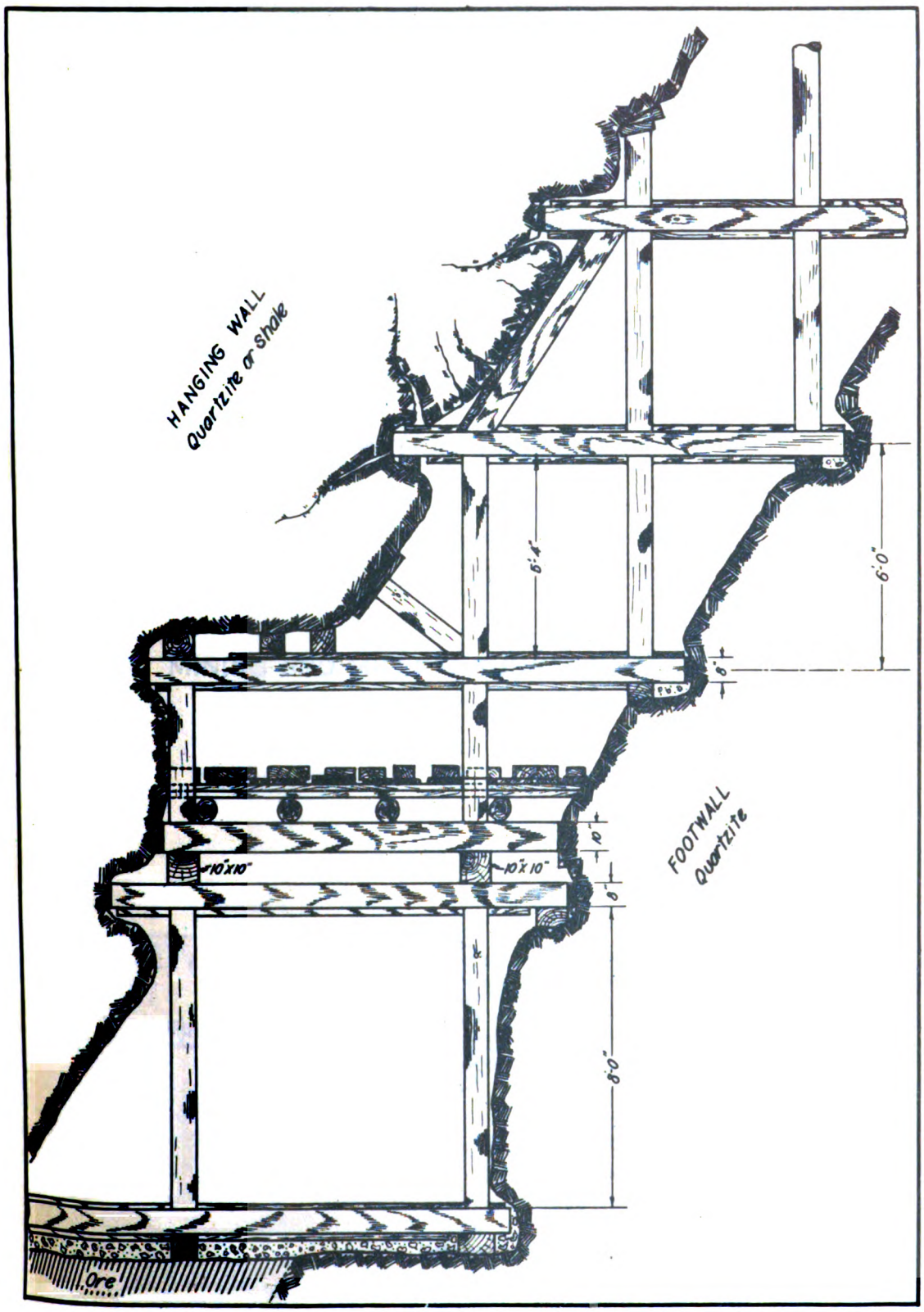

Figure 1.— Stope timbering, Eureka Standard mine.

Generated on 2024-09-18 02:03 GMT / https://hdl.handle.net/2027/osu.32435030644066
Public Domain, Google-digitized / http://www.hathitrust.org/access_use#pd-google
Digitized by Google
Original from
THE OHIO STATE UNIVERSITY